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ABSTRACT

The language of hearing impaired students differs from that of their hearing peers, and can affect their ability to comprehend printed material. Language can be defined as the knowledge of the integration of semantics, syntax, and pragmatics. Hearing impaired children will have difficulty in acquiring language at a normal developmental rate because they lack an intact auditory system and probably have not had adequate exposure or meaningful interaction with their immediate environment. The hearing impaired students' ideas about their environment, from which vocabulary and meaning are derived, develop in the same sequence as those of hearing children, but with varying degrees of delay. Hearing impaired students are less skilled readers and use the top-down process of reading, which applies limited prior knowledge, sight comprehension of some words, and limited syntax knowledge about word order. A large majority of hearing impaired students never achieves functional literacy. To combat the inherent problems of hearing impaired students, teachers must determine their instructional reading level, select appropriate reading materials, implement peer tutoring to provide additional assistance for these students, and realize that they are the students' most important source of information and so serve as vital contributors to the hearing handicapped child's knowledge base. Because hearing impaired children are so dependent on their visual sense, reading will be their primary tool for gaining access to information. (SRT)

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The Effect of Language Development on the Acquisition of Reading Skills in the Elementary Mainstreamed Hearing Impaired Student

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The Effect of Language Development on the Acquisition of Reading Skills in the Elementary Mainstreamed Hearing Impaired Student

Since the passing of Public Law 94-142, it is inevitable that the teacher in a public school setting will encounter at some time in his/her career, a hearing impaired student in his/her class of normally hearing students. (Hereafter, a hearing impaired or hearing handicapped student will be defined as any student with a sensori-neural hearing loss, regardless of degree of severity, that has occurred either congenitally or pre-linguistically.) It is our objective during this session to compare the language of the hearing impaired student with that of his/her hearing peers and demonstrate how his/her language or lack of it, will affect his/her ability to comprehend printed material.

Language Development

Language can be described in terms of 1) content or semantics - the vocabulary and its meaning, 2) form or syntax - the structure of word combinations, and 3) use or pragmatics - why certain words are chosen over others to convey specific meaning. Language can therefore be defined as the knowledge of the integration of semantics, syntax, and pragmatics. This knowledge is

transformed into a "code whereby ideas about the world are represented by a conventional system of signals for communication" (Bloom & Lahey, 1978).

In order to learn a language, it is generally felt that specific precursors must be present: 1) an intact peripheral sensory system (which includes the auditory system), 2) an intact central nervous system, 3) adequate cognitive abilities, 4) adequate and appropriate exposure to language, and 5) an opportunity to meaningfully interact with and experience the surrounding environment. If there is a problem in any one of these areas, then the child will not develop language normally. Therefore, the hearing impaired child will have difficulty in acquiring language at a normal developmental rate because he/she lacks an intact auditory system and has probably not had adequate exposure or meaningful interaction with his/her immediate environment.

The normal child develops language through constant auditory exposure coupled with visual stimuli in meaningful experiences. For example, the mother who is feeding her baby may preface this experience with "Mommy is going to feed you." During meal time, she makes linguistic reference to the activities as they are occurring such as, "Here's your cereal. Oh! It's too

hot!", and so on. As the baby is exposed to these types of experiences time after time, they become more meaningful to him/her because of the relationship between eating and related events that occur before and after mealtime. The baby begins to form percepts from the relationship between actions being performed and their linguistic representation. Concepts are derived from the percepts and these are stored in memory for later reference.

Once concepts have been established and locked into memory, meaning or content is derived from this stored information and from his/her cognitive ability, which is developing parallel to his/her language, and enables him/her to generalize from one experience to another. Thus, expression as well as comprehension depends on situational context, which determines the content of language. Form or structure is learned primarily auditorially. The child begins one word utterances and if these are positively reinforced, he/she will continue to utilize them in various situations. Once the child realizes that one word utterances are not completely satisfying his/her wants and needs, he/she begins to expand his/her linguistic language usage into phrases, sentences, and finally conversational discourse. Pragmatics or use of the language relies heavily on auditory feedback as well as the contextual situation.

The child's selection of specific words to fit a specific situation becomes refined as the variety of experiences increase along with the development of cognition. Somehow, by way of "osmosis" the rules of language are acquired. Through linguistically correct models, the normal child learns his/her language system in an apparently effortless fashion. After the acquisition of the language basis, the forms of reading and writing will later be developed (Quigley & Kretschmer, 1982).

Thus, it can be said that normal language is acquired through hearing words, associating them in contextual experiences, and then interacting linguistically in order to receive feedback. The child realizes that by using a variety of words he/she can obtain exactly what he/she wants. Thus vocabulary, sentence structure, and use increase as the need arises. The child acquires the ability to both comprehend and produce messages as he/she uses the language from day to day.

The hearing impaired child, on the other hand, differs in language development from the typically "normal" child. It is impossible to draw a composite picture of the hearing impaired child because of the degree of variation and numerous correlates involved

such as: intelligence, personality, environmental stimulation, time of onset of hearing impairment, site of dysfunction in the auditory system, age of intervention, type of impairment, and severity of hearing loss. The severity of the hearing impairment or degree of loss is usually described in terms of thresholds of sensitivity to pure tones in various frequencies (Davis & Silverman, 1970). The term "deaf" is used to describe those who have insufficient comprehension of speech even with amplification. The term "hard of hearing" refers to those who have functional comprehension of speech with or without amplification. The hearing impaired students that the teacher will encounter in public school will have a variety of hearing losses as well as language problems, ranging from mild to profound. The language problems will manifest themselves in the interaction of form with content and use. It seems that the hearing impaired student's ideas about their environment, from which vocabulary and meaning are derived develops in the same sequence as for hearing children, but in varying degrees of delay.

Reading Skills

Extensive studies of the development of the hearing impaired child's vocabulary have been conducted by several researchers (Griswold & Cummings, 1974; Hatcher & Robbins, 1978; Fusaro & Slike, 1979; Kyle, 1980). The frequency with which the hearing handicapped child uses various classes or words (i.e. mostly functional words - few descriptors) will differ depnding on the individual child. It has been found that the hearing impaired child uses a greater proportion of nouns and verbs in his/her language and fewer adverbs, prepositions, and question forms than the hearing child. Verb tenses are often incorrect or omitted. The hearing impaired child may have a functional vocabulary, but his/her sentence structure will be grossly effected because of his/her limited access to words and lack of their use. Thus, the delay in expressive vocabulary, syntax, and language usage will result in poor receptive skills - particularly reflected in the comprehension of printed words.

National surveys indicate that the majority of hearing impaired children have difficulty in reading comprehension. Researchers have provided various reasons for these reading problems in this handicapped population. Payne (1982), Giorcelli (1982), and Wilson

(1979) assert that the inability to make inferences from contextual clues coupled with a lack of understanding of figurative language is a major contribution to problems in reading for the hearing impaired. Quigley and Paul (1984) attribute below grade level reading abilities to not only the factor of deafness itself, but to all factors involved in the recognition and comprehension process. An impoverished knowledge base has been blamed for poor reading comprehension. However, this inadequate exposure to various experiences may only be a precipitating factor with the major cause stemming from the lack of a fluent communication system with which to internalize the experience into some meaningful code. This linguistic base includes not only speech encoding but also speech re-coding which is essential for access to meanings of words and for temporary storage of words in the temporal sequential memory which allows comprehension of more complex sentence structures.

Quigley and a group of colleagues studied reading comprehension abilities utilizing various syntactic structures. They found that eight year old children with normal hearing could outperform the average eighteen year old deaf hearing handicapped student. Quigley and Paul (1984) gave examples of how language effected the understanding of sentences:

A boy was helped by the man.
The girl heard the ball break the window.
The opening of the window scared the baby.

The deaf hearing handicapped students often interpreted the sentences as:

A boy help the man.
The girl heard a break.
The window scared the baby.

These examples demonstrate that comprehension of written language will be grossly effected revealing that compound and/or complex sentences are broken down into simpler sentences that may no longer convey the original meaning.

Skilled reading involves decoding of printed words (recognition) and the use of higher order cognitive processes for interpretation of meaning (comprehension) from the orthographic representation. If normal development has occurred, the higher order cognitive processes will be at least partially developed by the time a child is ready for reading. If the child has had exposure to a wide variety of stimulating and meaningful experiences by means of an integrated communication system, the cognitive base for his/her language and an internalized symbol system will have been established. The child will have stored in his/her memory, a variety of experiences so that he/she can manipulate as well as expand his/her symbolic language system and his/her

experiences. The prereading hearing child will bring with him/her to the reading task a richer background of experiential, cognitive, and linguistic experiences. He/she will also have the strategies of linking textual information to experiences and information he/she has already acquired. This ability to infer is an essential factor in reading comprehension (Gelman, 1978; Trabasso, 1980).

Studies reveal that the skilled reader utilizes a bottom-up process. They attend to the content words in a text, use individual letters for clues, and phonic knowledge for word recognition during their reading. The fluent hearing reader uses automatic unconscious word decoding skills which then allows him/her to focus his/her attention on higher order encoding processes. This provides the skilled reader with the ability to predict or infer what will occur in the text and permits him/her to link existing text information with prior information.

The less skilled reader uses the top-down process. Here, the reader applies limited prior knowledge, sight comprehension of some words, limited syntax knowledge about word order so he/she slowly gets a rough idea of the meaning of the orthographic message. This is probably the process used by some hearing impaired

children. This is not skilled reading because it lacks the automaticity and decoding strategies. It is not even adequate reading since the student has to concentrate on each word and its meaning. He/she is unable to utilize the higher processes for text prediction which link together the relationships between the text and previous experiences. Assessment in reading would reveal the number of misunderstandings and lack of detailed comprehension which is characteristic of this type of superficial reading. This superficial reading is typical of the less skilled or problem reader (La Berge & Samuels, 1974). Most hearing students can be included in this category as the following studies reveal.

Reading Assessment

Some of the earliest reported work on assessment in reading was performed by Pitner and Patterson in 1916. They found that the median scores of hearing impaired students (deaf, particularly), at any age on reading measures, never reached the median score for an eight year old hearing child. The most recent national study by Trybus and Karchmer in 1977, revealed essentially the same results. They discovered that at age twenty, the median reading score for deaf students was the grade equivalent of 4.5. They found that only 10% of the

hearing handicapped (deaf), whose placement was in the best reading group, could read at or above the 8th grade level.

The present situation for reading is one of low performance on standardized reading tests, with a large majority of hearing impaired students never reaching the functional literacy level. From this information, we may assume that the hearing impaired student will have great difficulty in reading materials at or above his/her grade level placement. It is apparent that many hearing impaired children neither read nor write the English language adequately and this is seen in below average educational performance in general.

In review, we know that the hearing impaired student's language is delayed, from slight to severe, depending on various concommitant factors. Their vocabulary may not be as diversified as that of normal hearing children of the same age. The hearing impaired population may have difficulty with inferencing and figurative language because of their limited knowledge base. They may have difficulty in some or all aspects of the reading process: sight words, syntax, word order, ability to identify and comprehend unfamiliar words from contextual clues, and general comprehension of text. The importance of the teacher being aware of the hearing impaired child's problems in reading is

obvious since this information will affect his/her selection of tests, methods, and materials. How, then, does the reading teacher determine the child's instructional reading level, which textbooks to use, and the best way to present material?

Teacher Responsibilities

The first task for the teacher is an arduous one of determining the instructional reading level. Normal reading diagnostic tests for the hearing impaired are rare. One test that is used for the hearing handicapped population is the Stanford Achievement Test for the Hearing Impaired (SATHI). However, the scores on this test must be used cautiously. It is suggested that the SATHI be used for placement in reading groups. Yearly progress reports should not be based on the SATHI alone since the standard deviation for the SATHI is three months. For example, if a student progresses only 2 months or 1/5 of a year in a 10 month school year, then the error is greater than the gain and no progress will be noted even though the child has improved in his/her reading ability. Other standardized tests that have been used to assess the reading level for hearing impaired are: the Woodcock, California Achievement Test, Gates-McGinite Reading Test, Wide Range Acievement Test, Test of Syntactic Abilities and the Iowa Test of

Basic Skills. Tests such as the above mentioned may be applicable to some hard of hearing students, but not for profoundly deaf students. They are normed for hearing children so these tests will not provide accurate information concerning reading ability and probably will be of little use to the teacher for placement in reading groups.

It is, therefore, the responsibility of the classroom teacher to become acutely aware of the informal testing measures that can be used with modification in assessing the reading performance of the hearing impaired child. For example, an Informal Reading Inventory can be utilized if the examiner eliminates the oral reading portions and looks for signs of frustration while the student reads silently. Questions should be reworded so that they are simple as well as brief and presented in written form, thus eliminating any misunderstandings. Another widely used informal assessment tool is the CLOZE procedure. In this procedure, words are omitted from materials that become increasingly more difficult. Words within the passage are omitted at regular intervals of every fifth or seventh word. The student silently reads the material and fills in the blanks according to his/her perception of the meaning. Readability formulae are

often utilized to determine the reading level of the CLOZE passages. Since readability formulae are, at best only an estimate of the difficulty of the reading material, they must be used cautiously. For example, because of the style of writing (syntax), vocabulary usage, or concepts presented, sixth grade materials may be more difficult than ninth grade material. The examiner may wish, then, to rewrite stylistically or conceptually difficult material so as to provide better clarity for the hearing impaired reader. Since hearing norms are used to compare children on standardized tests the SATHI, an Informal Reading Inventory, and the CLOZE procedure will provide more valid as well as useful information concerning the student's present reading ability. The teacher should use these test results in conjunction with her/his observations of the student's overall performance in all areas of the classroom.

The selection of reading materials is as difficult a task for the teacher as the diagnostic procedure. The only reading series designed for hearing impaired students is Reading Milestones. This series utilizes the "chunking technique" in presentation of the written passages. The concepts as well as vocabulary and syntax are very simplistic. The teacher may wish to use these

books only if she/he has a large group of hearing impaired readers. The cost factor to the school system will not warrant feasibility for purchase of the books if the teacher has only a couple of hearing impaired children in her/his classroom. Thus, the teacher has the difficult task of the selection of a basal reader - one designed for hearing students - for the hearing impaired student. She/he should select one that has minimal usage of figurative language. It seems that most of the basal reading series used in the public school systems are inappropriate for the hearing impaired reader. For example, a detailed examination by Dixon, Pearson and Ortony (1980) of reading series K-6 published by Houghton-Mifflin, Ginn, and Scott Foresman, found that with the exception of Scott Foresman, the readers of the other companies had an abundance of figurative language (metaphors and similies) at all levels.

The selection of an appropriate text will present many obstacles. Unless the series of textbooks has a parallel text, you may feel the need to re-write the text. However, this is not practical. The more practical approach is to provide study guides and/or syllabi to accompany textbook assignments. Another suggestion is to pre-teach the main ideas before

introducing the printed material. The teacher has to be cautious in not assuming that the child has knowledge about the content of the story he/she will read. Introduction to vocabulary, various idioms, complex sentence structure, and multiple meanings of words would be examples of pre-teaching activities that may prove to be of assistance later during the reading comprehension process.

The student should not be expected to read aloud during reading time, particularly if he/she is deaf and must use sign language as an augmentative communication channel. The child will never be a fluent reader if he/she has to fingerspell every word. It appears that most of these students are not given ample opportunities to practice reading silently. The teacher, on the other hand, needs to read aloud to her/his students, using total communication or an interpreter, everyday. The rationale for this being that printed English and spoken English are not the same. The process of the teacher reading aloud to her/his students will provide exposure to language, thus increasing vocabulary and ability to predict or infer what will happen in a reading passage.

The language experience approach is recommended for all children, expecially for those who are hearing handicapped. These experiences should be appropriate, meaningful, and interesting. The language experiences

in the classroom should provide multiple exposures to words in various contexts. An average child needs 30-35 exposures to a word before it becomes a mastered sight word. Because most of the sight words cannot be illustrated or defined clearly (i.e. "the"), the hearing impaired child will need even more exposure in various contexts in order to master words for later retrieval and use in interpretation of the text. Experiences will not only increase the child's vocabulary and assist in his/her understanding of the relationship of words (syntax) but also provide him/her with experience in inferencing. These activities should carryover to the text so that meanings of unfamiliar words can be determined based on contextual clues.

Knowing that your time as a teacher is limited because of the needs to interact with other students in your classroom, we suggest peer tutoring or a "buddy" system to provide additional assistance for the hearing impaired student. Asking another student to volunteer as a tutor or "buddy" will provide the hearing impaired student with a person who is willing to reexplain directions, share experiences and work with him/her on difficult assignments. The peer tutoring system can be rewarding for everyone involved.

The teacher of hearing impaired children must realize that he/she is the student's most important source of information. Hearing children rely on television, radio, other children, parents, etc. for general knowledge. However, the hearing impaired child has limited access to this information because of his/her handicap. Thus, the teacher becomes a vital contributor to the hearing handicapped child's knowledge base. Individual interaction, sharing of visual stimulae, vocabulary development, and opportunities to interact verbally are activities that the teacher can provide the hearing impaired child.

Conclusion

We can assume that the hearing impaired child in all probability, will be delayed in language, which results in a below grade level reading ability. The degree of severity of the language delay will directly affect the amount of reading difficulties that will be encountered by the hearing impaired child. The regular classroom teacher will have an arduous task of diagnosing the hearing handicapped child as well as selecting a basal reader that is appropriate for him/her. The teacher will need to provide supplemental learning experiences and classroom activities in order to develop, refine, and expand the student's conceptual

language base in the areas of vocabulary, sentence structure, and appropriate use of the language. Activities should be interesting, meaningful, and age appropriate so as to generate motivation.

Finally, since the hearing impaired child is so dependent on his/her visual sense, reading will be his/her primary tool for accessing information. The process of teaching reading may be filled with frustration, but knowing that you, the teacher, provided the hearing impaired child with a vital link to the hearing world will make all your efforts worthwhile.

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